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Effects of a third party observer and anxiety on tests of executive function☆,☆☆

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Abstract

For the past 10 years, research on the effects of observer presence on test performance has expanded in the neuropsychological literature. Previous studies have shown that the presence of a third party observer is associated with poorer performance on tests of effort, attention, concentration, learning, and memory. The present study was designed to investigate whether performance on tests of executive function is similarly impaired by the presence of a third party observer. The study also sought to examine associations among examinee anxiety, observer presence, and performance. Seventy-nine college undergraduates were recruited for the study, and 70 were included in the final analyses. Participants were randomly assigned to either the observation or control condition, and were administered verbal fluency tests, the Trail Making Test (parts A and B), and the Tactual Performance Test, as well as the Fear of Negative Evaluation scale and State-Trait Anxiety Inventory. Multivariate analyses of variance revealed that performance on the combined dependent variables was significantly associated with observer presence. A significant observation condition by trait anxiety interaction was also found. Univariate analyses revealed that performances on semantic fluency and TPT-localization were most strongly associated with observation and trait anxiety, with performance being poorer in the presence of a third party observer. Additionally, effects of trait anxiety on performance in the presence of an observer appear to vary depending on task characteristics. Implications and suggestions for further research are discussed.

Keywords: Third party observer; Social facilitation; Anxiety; Tactual performance test; Trail making test; Verbal fluency

In the past decade, considerable attention has been given to research on the effects of third party observers on neuropsychological test performance (McCaffrey, Lynch, & Yantz, 2005). The expanding repertory of studies demonstrating significant effects has led to the assertion by many neuropsychologists and neuropsychological associations that third party observation of neuropsychological examinations violates standardized testing procedures, jeopardizes test security, renders interpretation of norms less valid, and may be a breach of ethics and/or standards (e.g., AERA, APA, & NCME, 1999; Axelrod et al., 2000; Essig, Mittenberg, Petersen, Strauman, & Cooper, 2001; Hamsher, Lee, & Baron, 2001; McCaffrey, 2005; McSweeny et al., 1998). Issues surrounding third party observation are particularly salient for the field of forensic neuropsychology, given that attorneys often request to observe evaluations of their

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clients, and in some cases are legally allowed to do so (e.g., Essig et al., 2001; Lynch & McCaffrey, 2004; McSweeny et al., 1998).

Research in the area of third party observation first entered the neuropsychological literature when Binder and Johnson-Greene (1995) published a case study on a woman who demonstrated impaired performance on the Portland Digit Recognition Test, a test of effort, in the presence of her mother. Subsequent studies sought to examine the effects of a third party observer on performance on a variety of other tests assessing various neuropsychological domains. These studies have suggested that the presence of a third party observer may lead to impaired performance on tests of learning and memory, including number of perseverative errors on the Rey Auditory-Verbal Learning Test (Kehrer, Sanchez, Habif, Rosenbaum, & Townes, 2000) and number of words recalled at delay on the Verbal Paired Associates subtest from the Wechsler Memory Scale – Revised (Lynch, 2005). Impaired performance on tests of memory has also been found when the third party observer is an audiotape recorder (Constantinou, Ashendorf, & McCaffrey, 2002), a videotape recorder (Constantinou, Ashendorf, & McCaffrey, 2005), or a supervisor explicitly attending to the examiner rather than the examinee (Yantz & McCaffrey, 2005). Studies have also demonstrated impaired performance in the presence of a third party observer on tests of attention, sustained concentration, response inhibition, and verbal fluency, including digit span, the Paced Auditory Serial Addition Task, the Stroop color-word test, and the Controlled Oral Word Association Test (Kehrer et al., 2000). However, performance on the Trail Making Test (TMT) parts A and B, tests of attention and set-shifting, has not been found to be affected by the presence of a third party observer (Kehrer et al., 2000; Lynch, 2005), nor have tests of motor function including the Finger Tapping Test (FTT), Grooved Pegboard, and grip strength (Constantinou et al., 2005; Kehrer et al., 2000; Lynch, 2005). Interestingly, use of motor measures at the beginning of the testing session in attempt to facilitate adaptation to the testing process has been found to be effective only when a third party observer is not present, as unobserved examinees given an adaptation period performed better on a paired list learning task as compared with unobserved examinees not given an adaptation period and with observed examinees, regardless of whether an adaptation period was given (Gavett & McCaffrey, 2007).

Although the aforementioned studies have investigated the effects of a third party observer on neuropsychological test performance at the group level, no published studies in the neuropsychological literature have examined the contribution of individual examinee characteristics. One feature that can be expected to have a role in modulating the effects of social facilitation is the examinee's anxiety. However, comparisons of performance of individuals high and low in anxiety under observed and unobserved conditions in the social psychology literature have been somewhat inconclusive. For example, while Ganzer (1968) found that more highly anxious individuals demonstrated impairments particularly during the initial and later stages of learning on a nonsense syllable list-learning task, Martens (1969) found that high anxiety participants learned a complex motor task more quickly than those participants low in trait anxiety. Conflicting findings such as these suggest that a number of other variables may also contribute to the effects that an individual's anxiety will have on his or her performance, including whether a given test is timed. For instance, Siegman (1956) found that participants high in anxiety performed significantly worse on the timed subtests of the Wechsler Adult Intelligence Scale (WAIS) as compared with the untimed subtests, whereas performance on the two types of tests among low anxiety participants did not differ. In addition, in a test of experimenter- versus self-pacing, Mayer (1977) found that participants low in trait anxiety performed similarly in both conditions, while those high in trait anxiety performed significantly better when allowed to self-pace.

While no published studies in the neuropsychological literature have examined the contribution of anxiety to social facilitation or third party observer phenomena, a number of studies have looked directly at the influence of anxiety on neuropsychological test performance. For example, Buckelew and Hannay (1986) found that while performance on a variety of neuropsychological tests was not affected by trait anxiety, those participants high in state anxiety performed more poorly on a simple word fluency test and the block design subtest from the WAIS as compared with participants low in state anxiety. These two tests were rated as being significantly more difficult than the other tests administered, including the Digit Symbol subtest from the WAIS and the FTT, suggesting that high levels of state anxiety may be associated with poorer performance on difficult but not necessarily easy tests.

In another study investigating anxiety and neuropsychological test performance, King, Hannay, Masek, and Burns (1978) found that for women only, higher trait anxiety as assessed with the State–Trait Anxiety Inventory (STAI) was associated with poorer performance on both the FTT and the dominant hand and both hand subtests of the form board, a precursor to the Tactual Performance Test (TPT). Additionally, in an investigation of the effects of various personality traits on performance on 13 neuropsychological tests among 57 subjects with toxic encephalopathy and 57 healthy